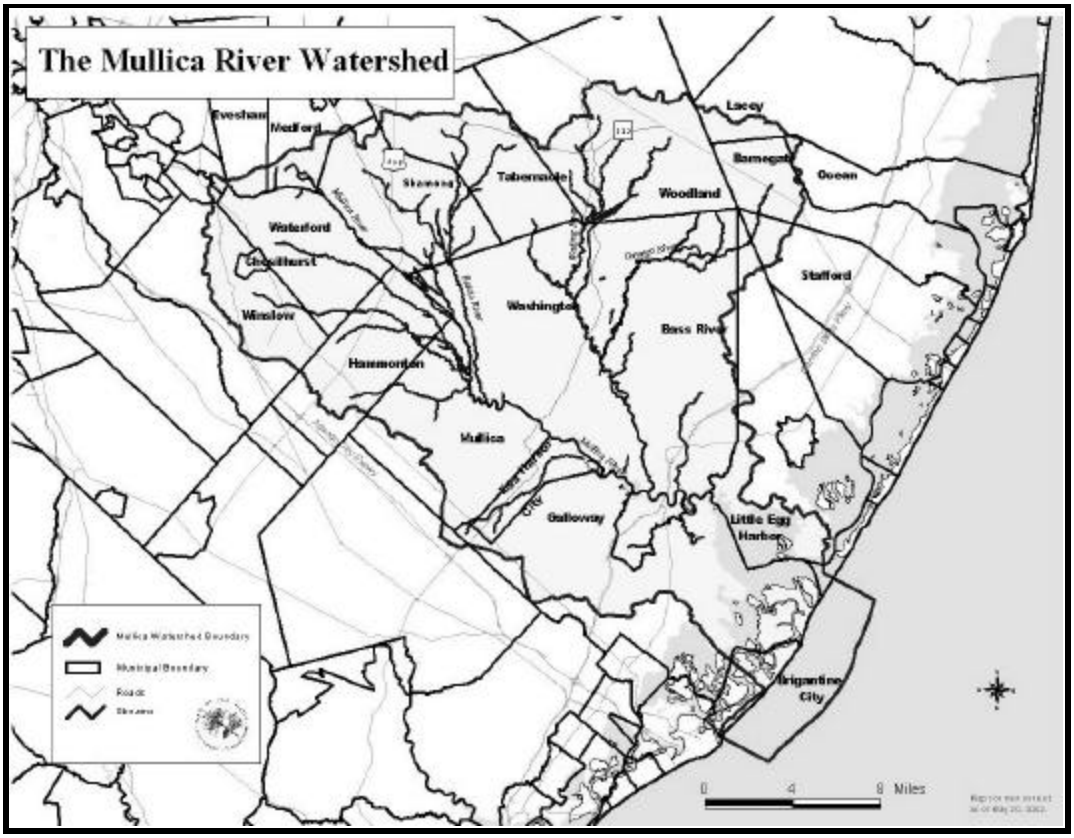
MULLICA WATERSHED WATCH

Newsletter of the Mullica Watershed Planning Project www.nj.gov/pinelands/mullica **Winter 2002-2003**

Action Now!

by Chris Krupka, Watershed Coordinator, NJ Pinelands Commission Staff

As part of the statewide effort to improve the quality of our water resources, the New Jersey Department of Environmental Protection created a program called "Action Now." During the watershed planning process, each of NJ's 20 Watershed Management Areas identifies opportunities for improving, maintaining or restoring water quality. Examples include development and/or implementation of Best Management Practices for stormwater management and other issues, land acquisition and technical studies concerning water quality, quantity and/or ecosystem health.



In the Mullica Watershed, members of the public and of the project Steering Committee were asked to submit ideas for Action Now projects, which were compiled into a list of approximately 80 potential projects. The Steering Committee then assessed that list and developed a "Top Ten" list of priority projects to develop and submit for funding. Pinelands Commission staff have been actively pursuing the highest rated projects and others for which we've identified an active lead agency or partner. The following are some examples of what we're working on.

Galloway Backyard Habitat Program

When homeowners convert part of their lawns to "backyard wildlife habitat," water is more easily absorbed by the soil in that area, resulting in better groundwater recharge and less stormwater runoff. Modeled in part on the National Wildlife Federation's program, this program will bring together landscaping and environmental professionals to teach Galloway Township residents how to create their own backyard wildlife habitats. The Mullica Project submitted a proposal to DEP last summer to fund this program.

Streambank Stabilization in Wharton State Forest

Representing approximately 25% of the land area in the Mullica Watershed, Wharton State Forest has been an enthusiastic partner in the watershed planning process. In the past, the illegal use of horses and motorized vehicles in stream and river beds resulted in erosion damage along the four Mullica tributaries that flow through the forest. *(continued on page 3)*

WHAT'S COOKIN' IN THE WATERSHED? Delicious recipes featuring foods grown or made in the Mullica Watershed.

This issue's featured food: the cranberry.

The Lenni-Lenape Indians were the first known harvesters of the cranberry (or "pakim," as they called it) in southern New Jersey. Today, the state ranks third in the U.S. for cranberry cultivation, producing about 10% of the national crop. Conditions in most of the Mullica Watershed are perfect for cranberry growing: acid soils, a top layer of sand and an abundant fresh water supply. Enjoy this tart and tasty watershed fruit in these two easy-to-make treats!

Cranberry Crunch Cake
(from *A Taste of The Country* cookbook)
Contributed by Betsy Piner, Pinelands Commission Staff

½ cup butter
1 cup sugar
2 eggs
1-½ cup all-purpose flour
2 tsp baking powder
½ tsp salt
¾ cup milk
1 tsp vanilla extract
1 cup cranberries, chopped or whole
1-½ cup miniature marshmallows
½ cup packed light brown sugar
½ cup chopped pecans
2 tbsp butter, melted

In large mixing bowl, cream butter and sugar. Add eggs; beat until well combined. In separate bowl, combine flour, baking powder and salt. Add flour mixture alternately with milk and vanilla to egg mixture. Fold in cranberries. Spread batter in a greased 13-in x 9-in baking pan. Top with marshmallows; press in to batter. Sprinkle with the brown sugar and nuts, and drizzle with melted butter. Bake at 350° for 25-30 minutes. When cool, sprinkle with powdered sugar if desired. Yield: 12-15 servings. *(continued on page 3)*

CREATURE FEATURE: The northern pine snake

by Kim J. Laidig, Pinelands Commission Staff

The northern pine snake (*Pituophis melanoleucus melanoleucus*) is generally associated with sandy pine and pine-oak forests within a geographical range centered on the southeastern United States. Pine snakes also occur in disjunct areas toward the north, with the northernmost population in the Pine Barrens of southern New Jersey. Outside the Pine Barrens, the nearest pine snake population is in western Virginia.

This large, somewhat chunky snake is a powerful constrictor that preys upon small mammals and ground-nesting birds and eggs. The size of an adult pine snake (four to five feet in length), together with the striking coloration of black to brown blotches on a whitish background, provides an unforgettable sight when occasionally seen slithering across one of many sand roads in the Mullica River basin. When startled or cornered, the pine snake is known to hiss loudly, shake or vibrate its tail, and even strike.

Slithering across the Mullica Watershed: the northern pine snake.

The pine snake's ability to excavate burrows for nesting and hibernating is one of the more remarkable characteristics of this species. In early to mid summer, a pregnant female may excavate a tunnel with an egg chamber in soft-packed sandy soil. The snake thrusts her head forward into the sand, hooks her neck around the loosened soil, and removes the sand while retracting her body out the burrow entrance. After the nest burrow is constructed, the female deposits from 4 to 16 large (2 to 3 inches long), white, leathery-shelled eggs in the chamber. Pine snake hatchlings emerge and leave the nesting burrow after a nearly two-month incubation period in the chamber.

Hibernation burrows are usually longer and exhibit greater complexity than nest sites. Some communal hibernation burrows have a main tunnel with numerous side tunnels terminating in chambers. The chambers serve as hibernation sites for individual snakes. For hibernation burrows examined in the Pine Barrens, the average tunnel length (including side tunnels) was 21 feet. Given the great energy expended in excavating such a burrow, it is not surprising that pine snakes may hibernate at the same site for multiple years in succession. The snakes enter the burrows in late fall when the air turns cool, and emerge the following spring to slither across the watershed once again. ≈

ACTION NOW! *(continued from page 1)*

This Action Now project, submitted in July 2002, would cover the costs of plants, materials and labor to stabilize several eroded streambanks in Wharton State Forest and do follow-up maintenance. The project will restore the natural vegetative cover and reduce stream siltation, which can impair water quality and hinder activities like canoeing.

New Gretna Community Wastewater System

Municipal officials and the Mullica Watershed Project envision the Village of New Gretna as an "eco-tourism" destination in the watershed, because of its proximity to natural and cultural attractions such as Bass River State Forest, Forsythe National Wildlife Refuge and Tuckerton Seaport.

However, New Gretna faces a major challenge to redevelopment due to a lack of wastewater treatment options. Because Pinelands waters are susceptible to degradation by nitrate-nitrogen, the Pinelands Comprehensive Management Plan (CMP) prohibits development on smaller lots unless they are served by centralized or alternative wastewater systems which are more effective than traditional septic systems. These options are expensive for small communities, but the continued use of traditional septic systems prohibits local businesses from expanding. These traditional systems may also be contributing to water quality problems.

This Action Now project would provide New Gretna with technical assistance to design a community wastewater treatment system, enabling the village to redevelop without degrading water quality. Together with municipal officials, local businesses and the DEP, we hope to create an economically viable and environmentally compatible system. Such a system could provide a model for other small Pinelands communities facing similar challenges.

Hammonton Stormwater Management System

Pinelands Commission staff, the town engineering firm, municipal officials and DEP have been discussing a proposal to map the stormwater system in Hammonton and then use that data to develop a plan to retrofit any failing outfalls and implement Best Management Practices to maintain them. Because nonpoint source pollution from stormwater runoff is typically a significant contributor to water quality impairments, this project could result in considerable improvements in water quality in this area of the watershed.

Mullica Watershed Stormwater Basin Assessment

The CMP requires that stormwater must be managed on-site in the Pinelands. However, some of the resulting stormwater basins are not functioning properly because of compacted soils, insufficient maintenance and even improper siting—but no comprehensive data exists to indicate how these malfunctions may be impacting water quality. This project would be completed in several stages, first assessing the stormwater basins in the watershed and later retrofitting failing stormwater basins and integrating these actions into regional stormwater management plans.

Other Action Now projects are currently being researched by Commission staff. We are also actively seeking alternative sources of funding to increase our chances of successfully implementing these projects.

Do YOU have a project idea? Submit a description to the Mullica Watershed Planning Project, NJ Pinelands Commission, PO Box 7, New Lisbon, NJ 08064 or email it to mullica@njpines.state.nj.us.

Mullica Watershed Planning Project

"Mullica Watershed Watch" is a newsletter of the Mullica Watershed Planning Project, which is funded by the State of New Jersey, Governor James E. McGreevey, through a grant from the New Jersey Department of Environmental Protection, and coordinated by the New Jersey Pinelands Commission in cooperation with our partners throughout the watershed.

We invite you to get involved. For more information or to submit your own projects, article ideas, organization events or other watershed happenings, contact:

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WHAT'S COOKIN' IN THE WATERSHED? *(continued from page 2)*

Cranberry-Apricot Irish Soda Bread

Contributed by Donna McBride, Pinelands Commission Staff

2 ½ cups flour
1/4 cup brown sugar
1 tsp. baking soda
1 tsp. baking powder
1/2 tsp. cinnamon
1/4 cup butter
1 1/4 cup buttermilk
3/4 cup dried cranberries (e.g., "craisins")
½ cup chopped apricots

Preheat oven to 375 degrees. Grease a cookie sheet. Combine dry ingredients, cut in the butter until mix is pebbly, and mix in buttermilk and fruit. Gently knead mixture a couple of times. Form into a round loaf and place on the cookie sheet. Cut a cross in the top. Bake approximately 45 minutes, then allow to cool and enjoy!

FOUR FISHING SEASONS ON THE MULLICA

by Ernest Deman, Pinelands Commission Staff

Note: Copies of the advisories that provide consumption recommendations for certain fish in particular regions and waterways throughout the state are available on the DEP website at: www.state.nj.us/dep/dsr/njmainfish.htm.

From **November through early March,** fishing might be the last thing on your mind—but stripers can still be found from the Garden State Parkway Bridge to several miles offshore. Most can be taken by jigging with bucktails and metal jigs, but don't overlook live eels, herring, clams and bloodworms to land some of the larger fish.

The striper's cousin, the white perch, is a wintertime favorite in the Mullica River. White perch tend to group together in channels and holes in the deeper reaches of the river, such as Collins Cove, located just west of the Garden State Parkway Bridge. This small inlet was formed when dredge material from the river bottom was used for the bridge overpass. Anchoring in these areas with top and bottom rigs baited with grass shrimp, small minnows, bloodworms or shedder crab will usually invite a response from these tasty fish. Collins Cove is also the most popular ice fishing location on the Mullica, during those few winters when the temperature drops enough for ice to form on the river.

Another favorite winter pastime is chasing chain pickerel and largemouth bass in some of the slower reaches of the streams and small lakes located in the watershed. Try using minnows under a float to bring in the big ones. This type of fishing can usually be done from shore, since most of the thick aquatic vegetation is gone during this time of year.

Starting in **late March and continuing through late May**, the next "season" can be both rewarding and frustrating. Blueback herring and alewives usually run in the Mullica during this time, with fishing activity increasing toward the end of the run. If you're angling for herring, you'll probably want to take a trip to the Batsto River with light spinning gear and small gold spoons or shad darts.

Many anglers keep most of their herring catch as bait for their next challenge: the striped bass. "Stripers" return to the river in the spring to spawn before heading back to the ocean for their northern migration. To bring in the larger bass, try live-lining herring or soaking bloodworms along the channel edges and flats in the river; cast diving and topwater plugs to attract the smaller, more aggressive fish.

Tautog (a.k.a. Blackfish) can be found along the banks near the Old Coast Guard Station and the Fish Factory, and can be landed with pieces of green crab or fiddler crab—try the same technique for white perch, too. Pickerel and bass will now chase spinners and plugs retrieved slowly.

As the summer heat starts to warm up the waters of the Mullica, so does the fishing activity. **From late May throughout the summer**, the stripers start leaving South Jersey for the cooler waters of New England. Taking their place is an assortment of other popular species, including the summer flounder, found in water ranging from 5 to 20 feet deep during the early summer (deeper as the season progresses). Bring in this fine eating fish with bucktails, jigs or top and bottom rigs tipped with minnow and squid.

The white perch, a cold-weather favorite in the Mullica.

Bluefish can also be found in the river from late April through late fall. The most popular technique for blues is casting or trolling bucktails, metal spoons and plugs—but don't overlook chumming for them while anchored. Be certain to include a length of wire leader or heavy monofilament to prevent these aggressive fish from cutting your line.

The vampire-toothed weakfish will respond to a variety of baits and lures. Fishing the mouth of the river, Grassy Channel and in front of Motts Creek, Oyster Creek and Big Creek with top and bottom rigs or bucktails and plastic jigs baited with shedder crab or squid is the best bet for this colorful and sometime noisy gamefish. You'll probably have your best luck when you anchor or drift in these locations during the early morning or evening hours, due to the limited amount of boat traffic. In freshwater areas, topwater lures can bring in pickerel and bass. Catfish can be found in the deeper portions of the river; try some of the stink baits or cut baits on a dropper rig for smaller fish, or whole small fish or filets on a fishfinder rig for some of the larger specimens.

As summer fades into **fall**, most saltwater species head for the deeper waters of the Great Bay and open ocean. To find schools of bluefish and weakfish, watch where the gulls and terns go in the early morning hours. Weakfish are often located underneath the school of roving blues, picking off the injured fish. These can be hooked with metal jigs or bucktails. Flounder move offshore in search of warmer water and structures from which to ambush prey—look for them around the many wrecks located along the coast. 6 to 10 ounces of weight may be necessary to reach these deeper hideouts. Again, minnow and squid can be a great bait combination, as well as small live bluefish, mullet and squid.

As the weather continues to cool, striped bass make their return migration along the Jersey coast. Drifting the inlet and *(continued on page 9)*

KIDS' CORNER

Watershed Word Scramble

by Rich Federman, Pinelands Commission Staff

FIRST, unscramble these mixed-up letters to form 7 words often heard in the Watershed.

C R R O E S E U

___ ___ ___ ___ ___ ___ ___ ___ ___

L Y E H A T H

___ ___ ___ ___ ___ ___ ___ ___

T R E W A

___ ___ ___ ___ ___ ___

A S T E E D W R H

___ ___ ___ ___ ___ ___ ___ ___ ___

A C N E L

___ ___ ___ ___ ___ ___

T O M P I N T A R

___ ___ ___ ___ ___ ___ ___ ___ ___ ___

C M A L I L U

___ ___ ___ ___ ___ ___ ___ ___

THEN, use the words you find to complete the message below!

_____ is our most _____

_____ -- let's keep the _____

_____ _____ &

_____ !

WATERSHED WANDERER

In this issue: Winter Wandering in the Mullica

by Brian P. Szura, Pinelands Commission Staff

In winter, many seek the warmth of their homes and close their doors to the icy chill and snow. The long days are gone, the colorful birds have flown, and the biting temperatures can have you longing for the warmth of a down comforter and cup of cocoa. But with a little bit of planning, lots of warm clothes and an explorer's eye, you will be ready to discover the beauty and wonder that winter has to offer.

Two of the best things about wandering the woods in winter are: 1) the chiggers are gone, and 2) the ticks are gone. Anyone who has had the misfortune of being plagued by a panic of chiggers or bothered by a bunch of ticks will find it hard to forget the suffering these creatures can cause. But when the weather turns chilly and the frost withers the sensitive fern, Satan's Little Surprises seem to have vanished (except for a straggler or two during warm spells). There's no need to tuck and tape your pant legs or to stop every five minutes to check yourself for these little devils, so relax and enjoy your hike!

One note of caution - if you plan to hike during hunting season, be sure to wear hunter orange or something bright. Leave that funny deer antler hat at home and save it for your next wild party. If you have any questions, be sure to check with the local state forest office. **Play it safe!**

So let's hit the trail! Feel the chill against your skin, smell the faint incense of wood smoke. Keep your eyes and ears open, because while the woods may seem quiet, there are still birds and animals to find if you look hard enough. Was that the wind rustling the trees, or a flock of blackbirds? Is that just a pile of leaves, or a squirrel's nest? What you see and what you find will only be matched by your sense of wonder and curiosity.

Nature becomes more dramatic in winter. The piercing sunlight cuts the chill air. The trees are bare, their stiff branches scratching the winter sky. Walk into a silent cedar swamp, however, and you are surrounded by lush, hushed greenery.

A wander through the woods will also uncover beautiful surprises like the tenacious red fruit of a winterberry still clinging to gray bark, or the unmistakable silvery leaves of a swamp magnolia glittering and shaking in the wind.

After a snowfall, the silent forest comes alive and the past is recorded for a time on the crisp, white tapestry. Animals write their stories in the snow as they scuttle and scuffle about on their missions to fill their bellies. Criss-crossed

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NEW RESOURCE AVAILABLE FOR COASTAL DECISIONMAKERS!

By Lisa Weiss, Watershed Coordinator
and Scott Haag, GIS Coordinator
Jacques Cousteau National Estuarine Research Reserve

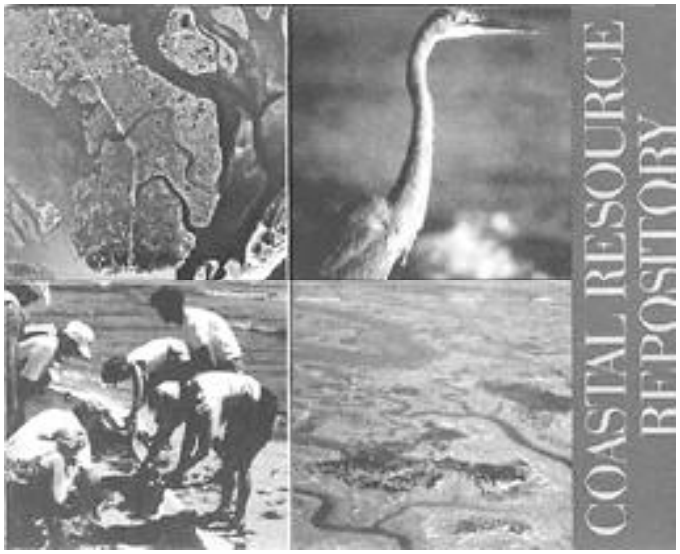
The Jacques Cousteau National Estuarine Research Reserve (JCNERR) is pleased to announce the availability of a new resource for coastal decisionmakers—the Coastal Resource Repository (CRR). The JCNERR is one of 26 national estuarine reserves created to promote the informed use and management of the nation's estuaries through an integrated program of research, education and stewardship. Spanning approximately 115,000 acres of the Mullica River/Great Bay Watershed, the JCNERR's boundaries enclose some of the most pristine habitats on the Northeastern coast of the United States. These habitats are a concentrated patchwork of federal and state lands managed in partnership through a variety of agencies.

The repository was created to promote use of innovative coastal management tools and current science-based information by coastal decision-makers. For example, the repository features a clearinghouse for scientific and technical information such as "Best Management Practices" (BMPs) aimed at promoting informed planning in southern New Jersey watersheds. Materials available for use at the CRR library or for loan include:

- Model environmental ordinances from municipalities across the nation
- Summaries (including agendas and notes) from the JCNERR coastal decision-maker workshops
- A variety of books and other materials

The repository also includes a comprehensive GIS databank that can be used to identify trends in spatial patterns for coastal decision makers (e.g., land use, land cover, rivers and streams, roads and demographic information) aimed at fostering science-based management decisions. Included within the databank is a dynamic Internet mapping site. The JCNERR interactive map server allows remote access of selected GIS data layers to anyone with an Internet connection. Users can identify features of interest, change map scale, activate GIS data layers, and explore the Mullica watershed boundaries using simple mapping tools. Many of these GIS data layers are available within the Internet Mapping Server, located online at http://crssa.rutgers.edu/projects/jcgis/intermap.html.

The Coastal Resource Repository will provide local officials with access to the latest scientific tools, allowing them to better understand, analyze and create solutions to environmental problems in coastal communities—and helping them to maintain and improve the quality of our



New Jersey watersheds. Using the CRR, coastal decisionmakers can plan their management strategies and assess the potential effects of their decisions now and in the future.

You are invited to use the resources available through the Coastal Resource Repository library, located in our Coastal Education Center in Tuckerton, NJ at 130 Great Bay Blvd. We would be pleased to demonstrate the capabilities of the repository and to describe the JCNERR programs and services available to municipalities.

For more information, email Lisa Weiss, JCNERR Watershed Coordinator at weiss@imcs.rutgers.edu or Scott Haag, JCNERR GIS Coordinator at scotth@crssa.rutgers.edu. Lisa and Scott can also be reached at 609-812-0649. ≈

Watershed Wanderer *(continued from page 5)*
tracks show you the way to where that hidden acorn fell, where the best paths from here-to-there are, and where the drama of a chase unfolded.

Enjoy the Mullica watershed this winter! Brave the elements and leave the confines of that cozy, comfy house to discover what surprises the woods have in store for you. Be aware of your surroundings, be inquisitive, and be sure to follow your instincts. And when your adventure is through, that down comforter may seem just a bit more comfortable, and that cocoa may taste just a little bit sweeter. ≈

Advanced Onsite Wastewater Treatment Comes to the Mullica Watershed

by Ed Wengrowski, Pinelands Commission Staff

The subject of wastewater treatment is not something that most of us think about very often—and understandably so. As long as we can flush, there's no reason to give the subject a second thought. Unfortunately, it is just that mindset that has shaped the way in which many of our onsite wastewater regulations have evolved over time.

Onsite wastewater disposal—as opposed to wastewater treatment—has generally been the prevailing concern. As the old saying goes, "out of sight, out of mind." But this approach has a hidden cost: non-point source (NPS) pollution. We're all responsible to some degree for this form of people pollution. The consequences of this "out of sight" but insidious pollution can affect our environment in sometimes not-so-subtle ways. Public health and delicate ecological balances can be adversely impacted by NPS.

Despite this gloomy picture, things *are* improving! That antiquated approach to dealing with onsite wastewater is about to change—and the Mullica Watershed will directly benefit from recent advances in treatment technology.

Conventional Onsite Wastewater Treatment Systems: Technology of the 20th Century

Conventional onsite wastewater treatment systems (septic systems) are generally comprised of pretreatment units (septic tanks and grease traps) and effluent disposal fields (beds, trenches and seepage pits). These systems are generally connected to nearby individual buildings or small clusters of buildings. The pretreatment units separate most of the solids in the wastewater from the liquid to facilitate better soil adsorption and discharge the clarified liquid effluent to a subsurface disposal field. Conventional septic systems do a very good job of preventing human disease by isolating the pathogens in the wastewater from people. However, conventional septic systems do very little to remove chemical constituents, such as nitrogen, from the wastewater, causing relatively high concentrations of these nutrients to be discharged to the environment.

To minimize the environmental degradation resulting from these nutrient discharges, relatively large land areas are required to dilute the concentrated nitrogen to harmless background levels. According to the Pinelands Septic Dilution Model, a typical single family residence requires 3.2 acres of land to provide adequate dilution of its wastewater. This is the classic example of dilution being the solution to pollution.

Advanced Onsite Wastewater Treatment Systems: Technology of the 21st Century

To ensure the continued protection and preservation of the high-quality surface and subsurface waters of the Mullica River basin and other Pinelands water resources, an amendment to the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50) took effect on August 5, 2002. These new rules establishing a "Pilot Program for Alternative Design Wastewater Treatment Systems" are bringing innovative technology to the Mullica Watershed—and should significantly reduce water pollution from residential septic systems.

The Pilot Program is the culmination of a two-year effort involving the formation of an Ad Hoc Committee on Alternative Septic Systems. This group was comprised of representatives from the Pinelands Commission, the Pinelands Municipal Council, the Pinelands Preservation Alliance and the New Jersey Builders Association. The Ad Hoc Committee undertook extensive research to identify emerging onsite treatment technologies with the ability to remove nitrate-nitrogen from domestic wastewater prior to its release to groundwater aquifers. The Committee was assisted in these efforts by NJDEP's Bureau of Nonpoint Pollution Control, Commission staff, professional consultants and other state and national experts in the field of advanced onsite wastewater treatment technologies.

Five advanced treatment technologies were selected for inclusion in the Pilot Program. The Commission will require the use of these technologies for all new residences on lots smaller than 3.2 acres. The treated effluent from the treatment units will be dispersed to subsurface disposal fields which comply with existing N.J.A.C. 7:9A (Chapter 199) standards.

The new technologies utilize innovative microbiological treatment processes to remove nitrate-nitrogen from wastewater through the process of biological nitrification and denitrification. They represent a wide range of treatment mechanisms and include a modified trickling filter, fixed film-activated sludge bio-filters (attached growth), a sequencing batch reactor (suspended growth) and a recirculating sand filter.

Removal of nitrogen from domestic wastewater effluent is considered important (particularly in the Pinelands) for several reasons. Excess nitrate concentrations (above Maximum Contaminant Levels (MCLs) as set by the Safe Drinking Water Act) in shallow aquifers used for drinking water pose a public health risk due to methemoglobinemia ("Blue-Baby Disease"), and have also been implicated in some forms of gastrointestinal cancer.

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These Teachers are all WET

by Chris Krupka, Pinelands Commission Staff

What walks sideways, uses its claws to crack clamshells, and has a New Jersey baseball team named after it?

If you answered "the Jersey Devil," maybe you should have joined a dozen teachers and environmental professionals who gathered together on Saturday, October 26 to answer this and other pressing questions. They came from towns in and around the Mullica River Watershed to the Mt. Misery Retreat Center in Browns Mills to learn about Project WET (Water Education for Teachers), a program of water-related activities for grades K to 12.

The day-long workshop was sponsored by the Mullica Watershed Planning Project (funded through the Pinelands Commission and the NJ Dept. of Environmental Protection).

In a classroom in the woods, the teachers started their Saturday with an introduction to the Pinelands given by Cindy Federman, a Voorhees Township teacher and environmental educator formerly of the Pinelands Institute at Whitesbog. Federman described the distinctive features that make the Pinelands unique, like sandy soil, tea-colored streams, and special plants and animals like the Curly Leaf Fern and the Pine Barrens Tree Frog. Participants also had the chance to get up close and personal with the samples she brought along—although not everyone wanted to get too close to the deer skull or the dead (and stuffed) mouse!

These Pinelands residents may have seen better days, but they still help Project WET participants to understand the environment around them.

Karen Heinsinger and Jean Demling from the Mullica Township Primary School share their innermost feelings about H_2O.

Colleen Gould, Project WET state coordinator, spent the remainder of the day leading the group through the Project WET Curriculum and Activity Guide, a collection of more than 90 water-related educational activities designed to supplement an educator's existing curriculum. With names like "Molecules in Motion," "People of the Bog," "Rainy-Day Hike," "Where are the Frogs?" and "Water Celebration," the lessons address water's chemical and physical properties, aquatic habitats and systems, quantity and quality issues, water management strategies and water's social and cultural constructs.

The teachers completed several activities just as their students would, even using crayons, pencils and a little "inner child" to explore their experiences with water through art.

"What's unique about this program is how the lessons can be related to almost any discipline, whether it's science, math, language arts, history, social studies and even visual arts," Gould noted. "A major theme of the guide is people's relationships to water."

Everyone who attended the workshop received a copy of the 500+ page Curriculum and Activity Guide, which is correlated to New Jersey's state curriculum standards. They also received 6 hours toward their state-mandated professional development requirements. And perhaps most importantly, they learned that our clamshell-cracking baseball team namesake is, of course, the Blue Claw Crab.

Wastewater Treatment *(continued from p. 7)*

Ecologically, nitrogen in the form of ammonia is toxic to certain aquatic organisms. In the environment, ammonia is oxidized rapidly to nitrate, creating an oxygen demand and low dissolved oxygen in surface waters. Organic and inorganic forms of nitrogen may cause eutrophication problems in nitrogen-limited freshwater lakes and in estuarine and coastal waters. The invasion of non-native plant species in Pinelands aquatic and wetland habitats may also result from excess nitrogen discharges to the Pinelands environment, which naturally contains very low levels of nitrogen.

The Pilot Program requires the systems to be covered under a five-year parts and labor warranty and to be regularly serviced by qualified personnel under a renewable, non-cancelable operation and maintenance contract. Treated effluent must be sampled and analyzed by a NJ certified laboratory on a quarterly basis during the first three years of operation to confirm conformance to nitrogen discharge limits. The systems will be authorized by the DEP for use within the Pilot Program and subject to local administrative authority approval through a generic treatment works approval.

The Pilot Program is a means to test whether these systems can be maintained and operated to meet the water quality standards contained in the Pinelands Comprehensive Management Plan in a manner which homeowners can be expected to follow. The Commission will maintain a database in which the analytical results of system monitoring will be compiled. The Pilot Program will assess the operation and maintenance requirements, equipment cost, installation issues, and the overall ability of each technology to meet the objectives of the Pinelands Protection Act.

For additional information on the treatment technologies and the requirements of the pilot program, visit the Commission's website at www.state.nj.us/pinelands.

Four Fishing Seasons on the Mullica *(continued from p. 4)*

surrounding area with eels on fishfinder rigs—or jigging bucktails and metal lures just off the beach—can end in a tussle with a big linesider. As the shallow freshwater temperature cools, try using the same slower approaches used during the winter months.

Fishing Today… and Tomorrow

Many of the fish species referenced in this article use the Mullica River and surrounding watershed for their spawning area. **Please think about your actions today, and the effect those actions will have tomorrow.** Catching a 10-pound weakfish or a 40-pound striper is a great accomplishment—but by removing that fish before it has a chance to spawn, you are actually taking thousands of eggs out of the local waters. Try releasing the larger females and keeping the smaller, more numerous males. Also, be conscious about where and how you operate your fishing vessel. Damage to the shallow-water breeding areas will only further reduce the number of fish available to future generations.

Meet Our Watershed Ambassador!

By Tammy L. West, Americorps Watershed Ambassador

My name is Tammy L. West and I have been selected as New Jersey's Watershed Ambassador for Region #14 (Mullica River Watershed). I graduated from the Richard Stockton College of NJ in 1996 with a B.A. in Business Studies and worked in business and finance prior to accepting this position. I am also credited with a Certificate of Eligibility in Elementary Education for the State of New Jersey.

As a lifelong resident of the southern Ocean County area, I have always had an interest in the local Pine Barrens region including the ecology and history of the area. My interest in the environment, public service, and my professional experience of working with the public is what led me to take this position. Being the mother of a young child, I am greatly concerned about the local watershed and how the public can directly affect its quality.

Stationed at my host agency, the Edwin B. Forsythe National Wildlife Refuge in Oceanville, my responsibilities include instructing volunteers on how to conduct River Assessment Team Surveys (RATS), visual river assessments and Biological Assessment Team Surveys (BATS) (classification and counting of macroinvertebrates) to gather information and statistical data on the the Mullica River and its tributaries, including the Batsto, Oswego and Wading Rivers.

Tammy West, Watershed Ambassador

Outreach and education to create environmental awareness will also be a large part of my duties. My training has included Project WET (Water Education For Teachers), a national program designed to assist education professionals to incorporate water education into their curriculum. Throughout the year I will be conducting presentations for schools, organizations and the general public on the local watershed region and the effects of point and non-point pollution on the area through the use of lectures, demonstrations and the DEP's hands-on Enviroscape watershed model.

If you are interested in having a presentation for your school or organization, please feel free to contact me at 609-652-1665 or gimpyfig@yahoo.com. Volunteer interest is also encouraged and greatly appreciated.